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Sambas Exploration Co.,
Limited, London

Gold in Borneo

London

1890

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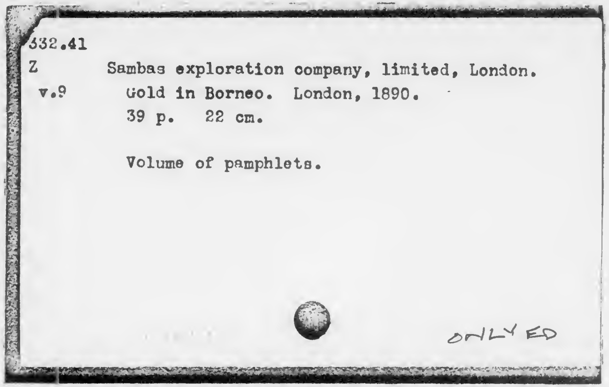

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GOLD

IN

BORNEO.

LONDON:
THE SAMBAS EXPLORATION COMPANY,
LIMITED,
66 & 67, CORNHILL, LONDON, E.C.,
AND
WESTERN BORNEO.

1890.

PRICE SIXPENCE.

The Directors of the
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Limited, have had the
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compiled from the latest
and best authorities for
the information of
Shareholders and others
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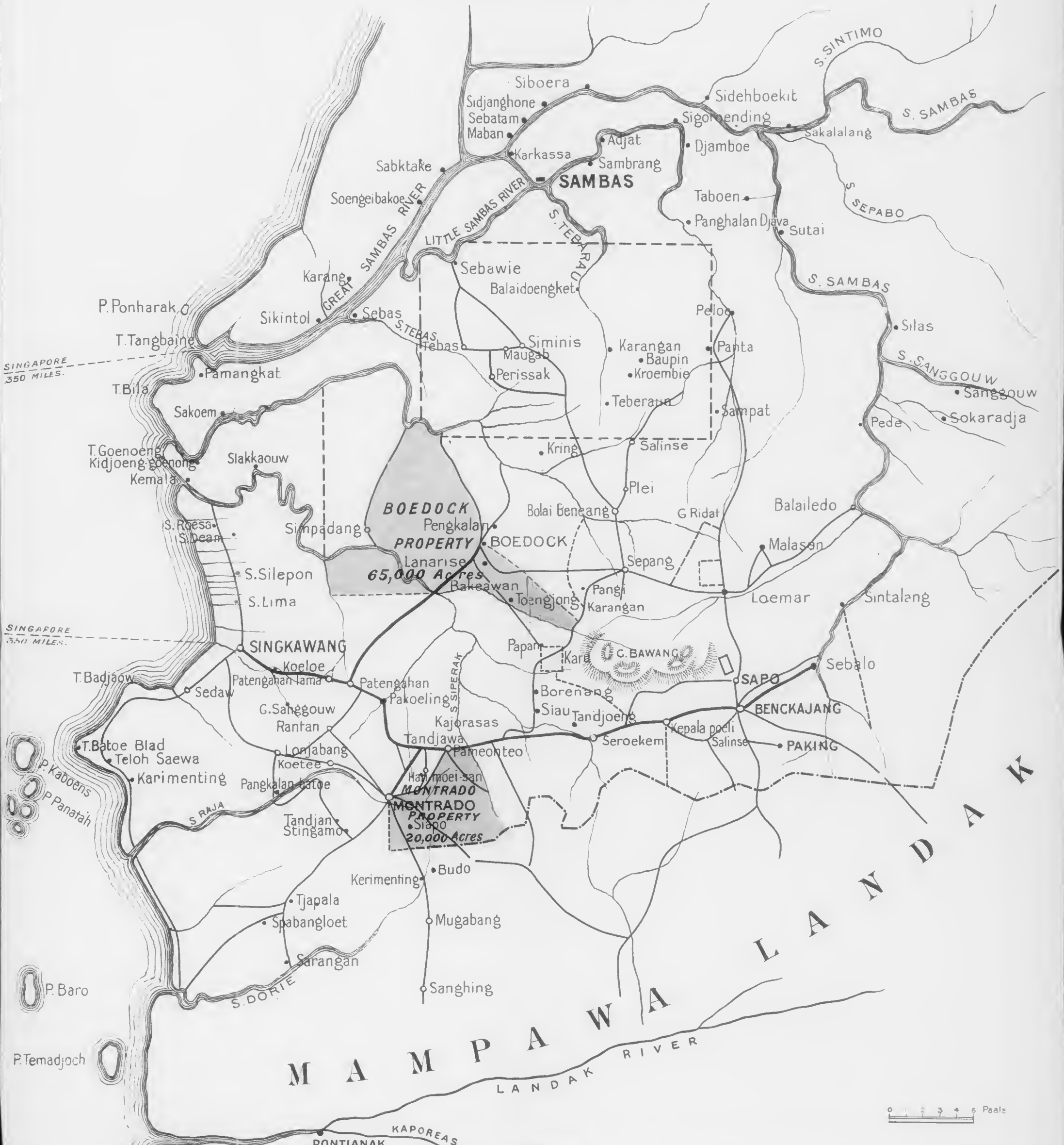

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BORNEO

AND ITS

MINERAL WEALTH.

THE GOLD OF SAMBAS AND THE DIAMONDS OF LANDAK, WESTERN BORNEO.

The Island of Borneo extends from 7° 7′ North to 4° 12′ South latitude, and from 108° 45′ to 119° 25′ East longitude, measuring at its extreme length nine hundred miles, at its greatest breadth seven hundred, and in circumference three thousand. With the exception of New Guinea, it is the largest island known. It is bounded on the North by the Solo Sea, on the East by the Straits of Macassar, on the South by the Java Sea, on the West by the China Sea. Situated in the track of the most extensive and valuable commerce, intersected on all sides with deep and navigable rivers, indented with safe and capacious harbours, possessing one of the richest soils on the globe, abounding in all the necessities of human life, and boasting commercial products that have in all ages excited the avarice and stimulated the desires of mankind. Of the existence of this extensive territory, so highly favoured by Providence, and enriched by the choicest productions of nature, there were until very recently scarcely a vestige of its geographical descriptions; and its rich products and fertile shore, by one tacit and universal consent, were abandoned by all the

European nations, and handed over to the ravages of extensive hordes of piratical banditti, solely intent on plunder and desolation.

Borneo, which is two days' steam from Singapore, was first discovered by European navigators in the beginning of the 16th century.

The Dutchman, Oliver Van Noort, first visited the island in 1598. A few years later his countrymen began to trade with it, and in 1609 they concluded a commercial treaty with the Sultan of Sambas and built a factory.

By far the largest portion of the island is ruled directly or indirectly by the Dutch, who have divided it into the Residency of Western Borneo and Southern and Eastern Borneo. The Western Residency has Pontianak as the seat of Government. The Southern and Eastern Banjermassin.

Mr. Alfred Wallace bears testimony to the very successful rule of the Dutch in Java:—

"Good roads traverse it in every direction, life and property are as safe as in any part of Europe, and the inhabitants are as happy and contented as any people are likely to be under the rule of an alien race."

It is only reasonable to suppose that the Dutch rule, which has been so very successful in the adjacent island of Java, will be equally so in Borneo, and as a matter of fact, the latest statistics of the Dutch Government show that Europeans generally have no more to fear, in the way of personal security and climate, than they have in the island of Java.

The Concessionaires, Mr. Robert Liddelow and Mr. Edward Louis Gordon, who travelled, in 1889, through many parts of Western Borneo, bear testimony to the courteousness and great kindness of the Dutch officials and native chiefs, and the peacefulness of the natives, as well as to the healthiness of the climate.

The population of Borneo may be divided into three classes:—

1. The Dyaks, who are the aboriginal inhabitants, and who constitute the great bulk of the population;
2. The Mahomedans, or Malays, for this name is now extended so as to include all the professors of Islam, whether true Malays, Bugenese, Javanese, or Arabs;
3. Last, but by no means least, the Chinese.

The Dyaks live chiefly in the interior of the country, and employ themselves principally with tillage, collecting the products of the forests, gutta-percha, resins, gums, ratans, wax, and also gold dust. They are divided into numerous tribes.

The Malays dwell on the coast, and are traders and sailors.

The Chinese, chiefly from Canton, have penetrated far into the interior. They are indefatigable workers, engage in trade, mining, and agriculture, and in fact, in anything out of which money can be made. They had commercial relations with Borneo as early as the 5th century, but made no settlement until a much later date.

From time immemorial gold, silver, copper, quicksilver, antimony &c., and diamonds have been found in various parts of the island.

It is, however, in **Western Borneo**, that the richest discoveries of gold have taken place.

Sir STAMFORD RAFFLES (1830) states: "Borneo is not only one of the most fertile countries in the world, but one of the most productive in gold and diamonds.

"Its camphor is the finest known, and it is capable of producing every kind of spice and other tropical produce."

With reference to the abundance of gold, it appears from the number of Chinese employed in the gold mines at *Mentrada* (Montrada), and other places on the Western side of Borneo, amounts to not less than thirty-two thousand working men.

When a mine affords no more than four *bongkals* (weighing about two dollars each, or something less than a *tahil*) per man in the year, it is reckoned a losing concern, and abandoned accordingly. Valuing the *bongkal* at eighteen Spanish dollars, which is a low rate of estimation, and supposing only four *bongkals* produced in the year by the labour of each man, the total produce is 128,000 *bongkals*, worth 2,224,000 Spanish dollars, equal to £556,000.

But it is asserted that, upon the general run of mines, seldom less than six *bongkals* per head has been obtained, and in very rainy seasons seven.

Taking the medium at six-and-a-half *bongkals*, the produce would amount to £936,000.

Such is the result of a very moderate calculation of the produce of these mines.

According to an estimate made in the year 1812, the annual produce of the mines on the West Coast of Borneo was 4,744,000 Spanish dollars, being in excess of a million sterling.

With respect to the disposal of the gold from the mines of Western Borneo, it may be observed that every native Chinese, whether employed in the mines, agriculture, as merchant or artificer, managed to remit every year at the least value of one *tahil*, more or less, of gold to his relations in China.

These remittances are generally made by the junks, and in gold, as it saves freight, is more easily smuggled on shore without the notice of the rapacious mandarins, and remitted overland to the residences of their families.

It is calculated that, one year with another, at least five hundred Chinese return in their junks to their native country, some with a competency, and many with a fortune. As the mines are worked with little or no machinery, and the returns are so good, almost every Chinaman would become a proprietor, as the property of the soil belongs to the first occupier; but this is prevented by the mode by which the services of the workers are first secured by the proprietors, or Council of the Kongsies. A parcel of half-starved Chinese, enchanted with the prospect of wealth on the golden shores of Borneo, readily find a passage in the annual junks that sail from the mother country, at ten dollars a head.

On their arrival, being unable to pay the passage money, and the tax of a dollar per head, established by the native authorities—while their immediate wants of clothing, food, and habitation are urgent and imperious—the proprietors of the mines find it easy to engage their services for three or four years. In some cases agents are employed to obtain men from China, on stipulated agreements, to work for a number of years, the usual rate of payment to miners being not less than five Spanish dollars a month. No sooner are these engagements concluded with their masters, than a number of them club together and commence a new mine, with the desirable result that in a few years they are enabled to return to China with a competency as the reward of their industry and perseverance.

With reference to the diamonds found in Borneo, there is no just foundation for the idea that they are inferior in quality to those of Golconda.

Many of inferior quality, have, no doubt, found their way into the market, but there is no reason to doubt, when properly selected and cut, the diamonds of Borneo will bear comparison with those of any country yet known.

Indeed, as far as we may judge, from the present state of our information, the Landak Mines alone are as productive, and its diamonds as precious, as those of any other in the world.

The principal mines where diamonds are regularly dug for and found in any considerable quantities, are those of Landak, Singau, on the great River Lawi, and the districts of Banjermassin.

Diamonds have been occasionally found within the limits of Borneo proper, at Matan and Sukadana. The mines of Landak are as ancient as the Malayan dominion on this island.

Diamonds are not only found in the bottoms of rivers when dry, but at the foot of craggy hills and mountains. The mines are dug to the depth of from one to five fathoms only, but experience has invariably proved that the deeper they are dug not only are the diamonds more abundant, but superior in size, shape, and water. The soil which produces the diamonds is a species of earth which stains the clothes of the miners, and is sometimes black, sometimes red, orange, and green. At Landak there are two mines worked by the Chinese, and in each twenty to thirty labourers are employed. So far back as 1738 the Dutch annually exported from these mines diamonds to the value of two to three hundred thousand dollars.

Few Courts in Europe could boast of a more brilliant display of diamonds than was exhibited by the belles of Batavia in the prosperous times of the Dutch, and it is well known that all these stones came from Borneo.

Among the larger diamonds found in these Bornean mines is the great diamond in the possession of the Rajah of Matan.

It is supposed to be the finest and largest diamond hitherto discovered. It is said to be of the finest water, and weighs 367 carats.

The celebrated Pitt diamond weighs only 127 carats.

The Matan diamond is shaped like an egg, with an indented hollow near the smaller end. It was discovered at Landak about 90 years ago, and though the possession of it has caused numerous wars, it has been about 80 years in the Matan family.

Many years ago the Governor of Batavia sent a Mr. Stewart to ascertain the weight, quality, and value of this diamond, and to endeavour to purchase it, and in this mission he was accompanied by the Sultan of Pontianak.

After examining it, Mr. Stewart offered 150,000 dollars for the diamond (the sum to which he was limited), and in addition to this sum two war brigs, with their guns and ammunition, together with a certain number of great guns, and a quantity of powder and shot. The Rajah, however, refused to deprive his family of so valuable a hereditary possession, to which the Malays attach the miraculous power of curing all kinds of disease, by means of the water in which it is dipped, and who also believe that the fortunes of the family are mysteriously connected with the possession of this wonderful stone.

CRAWFORD (1820) says, that the practice of mining for gold from alluvial deposits in the Indian Archipelago is pursued by both natives and Chinese, but systematically, skilfully and effectually as to production, only by the latter. The chief seat of the Chinese mining operations is Borneo, and of that island, principally the territory on its west coast, situated towards the mountains, and lying between the rivers of Pontianak and Sambas. The country is usually denominated Montradak, from the name of the principal town or village, which is situated about two days' journey—or, rather, voyage, as it is an inland navigation—from the coast. The whole tract is alluvial, and channelled by the beds of numerous rivers, some of them of great size. Crawford's information respecting the economy of the mines was principally got from personal communication with Chinese who were for years engaged in them. The whole Chinese population of this part of the country amounts to 36,000, of whom 4,000 only are women. Part of the latter are of the mixed Chinese and native race, the greater number being natives of the place, purchased or kidnapped. Six thousand of the whole of this population only are directly engaged in the working of the mines, the rest being occupied in trade or agriculture, or in branches of industry subservient to the working of the mines. Like the tin mines of Banca, the economy and circumstances of which they very closely resemble in many particulars, the gold mines of Montradak are divided into large and small. Of the first there are thirteen at present wrought, of the second five. The principal difference in these consists not in the amount or the fertility of the ore, but rather in the greater or smaller capital which is employed in working them, and, of consequence, in the principle and extent to which the mining operations are conducted.

The great mines are wrought by companies of persons of property and capital, who employ monthly labourers. The smaller mines, on the other hand, are worked by the mere labourers, who at once conduct the operative parts and share the proceeds on terms of perfect equality. The large mines employ 100 to 200 men, including labourers and overseers; the smaller 10 to 50. The economy of the large mines is chiefly worthy of notice.

The mode of paying the labourers is by monthly wages, with a supply of food. An inexperienced labourer receives for the first four months 2 Spanish dols. a month; for the second four months, 4 dols.; and for the remainder of the year 5 dols. Ever after he receives 6 dols., and if he has capacity and integrity to make an overseer, 8 dols. In defiance of the climate, the miners labour severely. They work about twelve hours a day, beginning their operations by break of day, or, if there be moonlight, earlier, not ceasing until half-past six at night, and taking very little time to their meals.

The chance of an increased produce from the mines of the Archipelago, says Crawford, will depend upon the share of tranquility which the country enjoys, and the degree of freedom secured to its commerce. Nothing further is requisite, for the ore, from all accounts, exists in inexhaustible abundance. This is most particularly applicable to Borneo, the immense alluvial tracts round the whole circumference of which everywhere contain rich deposits of this metal, from whence it necessarily follows that the primitive mountains of the interior must contain veins of it. From the abundance of the ore, and the usual fascination of all mining projects, especially those in quest of the precious metals, the search for gold will be the first object to engage the attention of any enterprising and industrious people settled in the country, of whatever race.

J. H. MOOR (1837) says, gold is found in almost every part of the Residency of the north-west coast, in the "areng" strata. The gold of Sintang, Sanga and Landak is about 9 touch; of Muntuhari, about 8½; of Mandor, a shade below 8. These are places under Pontianak. That found at Montradak under Mampawa, is about 8 touch; under Sambas, of 9 touch; at Sapan, of 8; at Larak, of 8½; at Siminis, of 8; and at Salakao, 7½. The mines are worked thus: A shaft, barely sufficient to allow the miner to turn round in, or at most two feet in diameter, is sunk to the "areng" strata—a kind of yellowish gravelly earth, mixed with various sized pebbles, and which also contains at times diamonds. This stratum is 1 to 3 feet thick, and is dug out to the extent of 7 or 8 feet from the sides of the shaft under the upper strata, which sometimes are propped up; but this precaution is often neglected, which is the cause of frequent accidents. The "areng" is hoisted up in small baskets by bamboos, on the ends of which part of a branch is left and forms a small hook. Small "dulans" (circular trays slightly converging towards the centre), are nearly filled with "areng," and the workman (a Dyak, Malay, or Chinese), sitting himself in the nearest stream, immerses the dulan and works the earth by hand until the earthy particles begin to separate; the "dulan" is then brought to the surface, and a rotatory motion is given to it until the water it contains, being saturated with earthy matter, is poured off. This is continued till such time as the water comes away clean; the gold from its greater gravity collects in the centre. The Sultan of Sambas has a lump weighing 12½ *bongkals*, and says he has seen some weighing 25 *bongkals* (1 *bongkal*=832 grains).

HUNT (1837) says, that the principal gold mines of Borneo are in the vicinity of Sambas. There is a mountain called Guming Pandan, about 80 miles inland; from this branch out rivers; one leads to to Mampawa, one to Batu Bulat, near Tunjong Mora, and one to Landak. The whole intermediate area between the rivers is a firm, yellow, argillaceous schist, or a ferruginous quartz, interspersed with vitreous ores of a remarkable dark-reddish colour, abounding with the richest veins of gold, and equal, if not superior, to any mine extant.

There are only 50 "parets" or mines now wrought in the whole kingdom of Sukadana, 30 of which are in the Sambas district, each mine having at least 300 Chinese employed.

Their pay, one with another, is 4 dols. (16s. 8d.) per mensem.

The mines are rented from the Raja at the rate of 50 *bongkals* (86½oz.) of gold per annum, besides a capitation tax of 3 dols. (12s. 6d.) per head on every Chinaman. There are 30,000 Chinese in the Sambas district, and they feel themselves strong enough to oppose or evade this tax; it hence becomes a perpetual contest between greedy extortion on the one side, and avaricious chicane on the other. There are besides about 12,000 Malays and Dyaks.

The Larak gold mines are situated to the eastward of the town of Sambas, and are particularly rich and productive. The mines of Siminis are a day's journey from Sambas, up a small creek leading to Sambas River, below the town; and the mines are abundant Salakao is up a river 15 miles south of the Sambas River; it lies nearly 40 miles up, but communicates with Sambas by another river. Here the metal is found more abundant than anywhere else, and 20,000 Chinese are in this district.

Montradak is three days' journey up the Mampawa River; it is under an independent Malay prince. Some accounts make the population of this district great, near 50,000 Dyaks, Malays, and Chinese; but perhaps half the number may be nearer the truth. These are chiefly employed on the gold mines, and in producing food for the miners. These mines, however, do not produce that quantity which they might, under Chinese management.

Mandor is about a day's journey from Pontianak, and belongs to the Sultan; it is reckoned a very rich mine, though but recently wrought. There are as yet only 12 parets of about 200 men each, but it is capable of extension. Numbers of Chinese are settled in this district, and the population is annually increasing.

About three days' journey up the Pongole River lies the district of Sanga, with a population of 25,000 souls, Dyaks and a few Chinese, under a Malay independent prince. The population is chiefly employed on the rich mines of gold in the neighbourhood, which is particularly pure and abundant; but the mines are not wrought with the same industry as those under the Chinese management. The Dutch thought it of so much consequence as to keep a force at Sanga, and to place the present Rajah on that musund. About two days' journey farther up lies another gold district called Sintang, the inhabitants of which are principally Dyaks. Beyond Sintang, and higher up on the same river, lies the town of Sukadana, abounding in gold, the inhabitants of which are also Dyaks.

The Matan mines of gold are abundant, and capable of becoming highly productive.

About three days' journey from Pontianak lies the celebrated mountain of Landak, which, "after Golconda, is the most valuable diamond mine in the world." Here, also, much gold is produced, and much more might be had under proper management.

The whole produce of the gold mines of Sukadana is said to be annually about 20 *piculs* (3,433 lbs.), or 1,000,000 dols. (£200,000), at 25 dols. (£5) a *bongkal* (832 grains); but no calculation of this sort can possibly be correct. Living, as the Chinese do, under the rapacity of despotic and ferocious freebooters, who are actuated by no one principle of honour, justice, or good faith, it is their interest to conceal the riches they amass, not only to preserve themselves from the clutches of these tyrants, but as the most compact substance to transport to their native shores, to which they repair with the fruits of their industry by the annual junks that arrive at Pontianak, leaving the mines to new settlers; 200 or 300 leave Pontianak every year.

The standard of Salakao gold at Pontianak is fixed at 23 Spanish dollars the *bongkal* of 2 dols. weight. The Sanga and Larak is 25 dols. the said *bongkal*.

Not having had an opportunity of inspecting any of the gold mines personally, Hunt does not know if the ores readily melt of themselves, or whether they equire the aid of any fluxes before they yield the metal; but he believes the principal attention of the miners is directed to the rich veins of pure native gold, and that no operation is performed beyond that of pulverising and simple washing, all the gold about Pontianak being in dust, though some he met with in Borneo proper was run into bars.

Sir JAMES BROOKE, Rajah of Sarawak (1842) says, that the quantity of gold yearly procured at Sambas is moderately stated at 130,000 *bongkals*, which reckoned at the low rate of 20 Spanish dollars a *bongkal*, gives 2,600,000 Spanish dollars, or upwards of £500,000 sterling.

Reviews from the "STRAITS TIMES," Singapore.

(First Article.)

Dr. THEODORE POSEWITZ has just published at Berlin a work dealing with the geology and mineralogy of Borneo, based on personal research and documentary sources. Dr. Posewitz spent three years on the island, and consulted many works and manuscripts dealing with the subject matter, which, from being in the Dutch language, were not readily accessible. The results of his enquires he has embodied in the book in question, which offers many noteworthy points. For instance, he treats at great length of the precious stones and metals found in Borneo, and gives particulars of them highly interesting in these days of mining concessions and gold companies in that island. The gold deposits there receive ample attention, and have abundant light thrown upon them. "Dr. Posewitz points out at the outset that Borneo has long borne the well-deserved reputation of being rich in gold, which, from all appearances, has been mined for by the natives from time out mind. They took the more readily to it, from the metal being generally found in deposits which admitted of washing the ore easily and cheaply. The primitive nature of the methods pursued resulted, nevertheless, in the yield of the diggings being comparatively scanty in the hands of the sons of the soil. So matters stood until the 13th century, when Chinese gold seekers began to flock into the country in such numbers that the tract between the Sambas and Landak Rivers became known as the Chinese districts. There they settled down to mining pursuits. As they grew stronger in numbers, the Chinese established kongsies, or companies, on the co-operative principle, giving each member a share in the profits of the mines. From being merely miners' unions, these kongsies, as they gained strength, became political bodies, and gradually built up a number of small federative republics. Breaches of their rules were followed by heavy penalties. For ordinary theft, cutting off the ear was nothing unusual. Death was the penalty for stealing gold dust. Union gave these kongsies such strength and command of capital in West Borneo that they found means to construct reservoirs, conduits, and water-courses, to turn the gold-bearing land to as much account as possible. So matters stood until the middle of this century, when the Netherlands India Government, which had then gained a footing in the country, determined upon putting an end to their political importance. The resulting war, after years of fighting, brought the kongsies under, and led to the decay of the once flourishing gold mining industry. Thousands of miners fell in battle or had to fly the country. The capital of the kongsies melted away to meet warlike expenses. On the restoration of order the gold mines were almost deserted. In course of years a revival of mining industry took place, but it has not yet recovered from the blow. The prosperity of bygone days has indeed become a thing of the past. Europeans did not try their hands at gold digging until 1880, when a French mining engineer named Simonar secured a concession for 75 years to dig for gold, platinum, diamonds and coal in the neighbourhood of Martapura. Three years afterwards the concession passed into the hands of a company. In Borneo the precious metal in river sand, deposits in higher ground and in rocks. Most of the rivers there bring down gold

more or less. In the western portion of the island, the Sambas and Landak rivers especially abound with gold as well as their tributary streams. The southern rivers contain much gold sand, chiefly along the course of the Barito. All the eastern streams are also rich in gold, except in the State of Cotie. The same may be said of North Borneo, save Brunei, regarding which information is lacking. In British North Borneo the number of gold bearing rivers seem to be great, but the quantity found varies not only with the rivers, but also along one and the same stream. The river sand gold throughout the island shows very fine grains, intermixed with grosser particles. The largest piece found in Sarawak weighed seven ounces. This fine gold comes from deposits higher up or in the mountains. Dr. Posewitz dwells at great length upon the characterising features of these gold deposits, and says that the richest are found in the tract between the Sambas and Landak rivers, better known as the Chinese districts. There rich diggings are met with almost everywhere, and miners have not failed to take advantage of them. The deposits in South Borneo show much less richness. Very little is known how East Borneo stands in this respect, but gold fields are said to be worked extensively there. In North Borneo, gold deposits form a characteristic feature of Sarawak proper over large stretches of country. It is doubtful whether the same can be said of Brunei. In British North Borneo deposits of the precious metal have been found along the banks of the Segama river for long distances. Judging from available information, if the island be divided into halves, N. W. and S. E., the distribution of gold will be found subject to some law. The N. E.

half shows every sign of poverty in that metal, while the south-west half has abundance of it. There, Tanah Laut, Kusan, and Sambas abound with gold-bearing rocks. The basin of the Kahayan River is said to be very rich, too, but is as yet unexplored. The mountains in the interior of the island show, so far, no signs of gold. In this part of the work the author enters fully into the geological character of the gold deposits, and the indications they present."

(Second Article.)

"The gold deposits in the mountains present characteristics different from those found in the valleys. The former class may be deemed the original deposits, the latter being of alluvial origin. In the mountain mines the ore is found in deposits varying in thickness from a few inches to several yards. The richness of these diggings is very variable, and shows wide extremes, even on one and the same spot. The ore comes from the wearing away and decomposition of auriferous rocks in the mountain region. Not much is yet known of the extent of the valley deposits, owing to difficulties in survey, and their thickness varies extraordinarily. No positive information is available as to the age of both these classes of deposits, but in one mine at Gunong Luwak, remains have been found of buildings, and also an anchor, showing an elevation of the coast in recent times. Researches have traced the gold of the valleys to rocks in the mountains, chiefly syenite and diorite. In the Chinese districts of the West Borneo, this fact has been the best determined. In North Borneo such discoveries have only just been made. In the southern portion of the island, the sources of the gold in the lower country have not yet been traced out. In the Chinese districts, where mining research has been longest carried on, thick, regular, and extensive lodes have nowhere been met with. Small lodes are not unfrequent, consisting of auriferous pyrites, and sometimes the precious metal occurs in these lodes mixed with copper, iron, and antimony. Most of the gold brought to market is more or less alloyed with silver, and sometimes with copper. Dr. Posewitz only gives two recent analyses. One of them—that of gold sand from Selinse to the south of Bankayang—showed 86·5°/o of gold to 7·8°/o of silver, and 5·7°/o of impurities. The other—lode gold from Sikarim—gave 82°/o of gold to 18°/o of silver. In his opinion, the best gold comes from Sepang in West Borneo, which bears a high reputation for pureness. The natives profess to distinguish two kinds of gold, which they call by the names of *mas muda* and *mas tuah*, literally young gold and old gold. The former bears a more or less bronze yellow colour, owing to the presence of silver, while the old gold attracts notice by its reddish yellow hue. This characteristic betokens the purity of the gold. The quality of the metal varies greatly with its place of origin. The natives distinguish besides between the diamond gold, or *mas intan*, which is found in the diamond fields, and 'dead gold,' or *mas mati*, meaning, thereby, melted or used gold. Gold is also found on the sites of dwellings which have gone to ruin. Mention is also made of so-called 'black gold.' The natives, both Malays and Dyaks, chiefly mine for gold in the river sand, and in the deposits. Lodes are very seldom worked. River gold is most sought after, owing to the easy way of getting it. Women and children take most to it in the dry season on sand banks in shallow rivers. Banks in the rivers, and also other spots where the gold is the most likely to sink, are also turned to account. The gold washers stand in the stream, fill round wooden dishes with floating sediment, and shake the dishes in the water until the fine sand and gravel are removed, leaving the heavier gold sand behind. The washing is repeated until fairly pure gold remains behind. The natives also get gold sand from deep in the river beds by diving and scooping it up in dishes. They turn the deposits to account in an equally primitive manner. To find out a lucky mine they rely upon a bird called Burong Soho, which is said to alight and sing upon spots abounding with the precious metal. The sites having been pitched upon, small shafts are sunk, especially along any lead that presents itself. As the mines get deeper, they remove the overlying earth until they reach the gold-bearing stratum. The precious stuff is then borne away in baskets to be washed in dishes in the nearest water course by women and children, the men keeping themselves to mining operations. Should the yield prove rich, other pits are sunk, until the ground is fairly turned over. When close to each other, shafts communicate from one pit to another, and their sides are seldom shored up. The sides of the pits often fall in upon the miners. When luck ceases to befriend them, the latter break fresh ground. The natives have no idea of using water conduits, and have every need of running water near the diggings. Without it, the richest mine does them no good. The Dyaks seldom follow up a lode, but they do so at Karangan, Gantung, and Selinse, in the Chinese districts. On reaching it by a pit, the stone is broken up with iron tools, and brought to the surface after the steadily inflowing water had been baled out. At Selinse, the sinkings are too close to be safe, and at Gantung the lode has been followed for several hundred yards. The pieces of stone loosened with iron tools are smashed with hammers. After sorting, the larger pieces are hammered again and the smaller pieces are stamped fine in common rice mortars. The fine stuff is freed from white quartz sand in dishes worked with water. Other washings follow until the larger portion of the gold is secured. What is left goes through more stamping and washing until almost all the gold comes out. Women manage this. The gold so obtained is very fine, the largest grains equalling pins' heads in size. This method of operation is not only troublesome but also results in a large portion of the gold being lost. The hammers used are of quartz stone fastened with rattan to bamboo handles. The Chinese mode of mining will be dealt with in a subsequent article."

(Third Article.)

"The Chinese mine for gold in river sand, diggings on dry land, and in rocks, but get most of it from mountain and valley deposits. The river bed washings give them so little profit, and getting gold from the solid rock proves so troublesome and unsatisfactory owing to their imperfect technical knowledge, that they much rather betake themselves to the valley deposits. The latter they can work with greater readiness, and can turn to more profitable account with less trouble. They differ from the native miners in one very important point. The natives take the ore to the nearest running stream, but the Chinese bring the indispensable water to the mines. To the natives, waterless gold deposits are utterly worthless, and the extensive working of diggings is an impossibility, but the Chinese are never at a loss to make gold-bearing places accessible, do their best to secure every particle of the precious metal, and make more profit than the sons of the soil. Trial borings enable the Chinese to detect signs of gold deposits in the valleys, which they work in an old-fashioned manner, unchangeable for the most part. To work a valley deposit, the first thing taken in hand is a water conduit from the nearest stream or other sources at a distance, no matter at what trouble and expense. Valleys are dammed to store up the water and collect it in reservoir. All the brooks in the neighbourhood are carefully led to the reservoir to increase the stock of water, hillocks in the way being dug through. Lakes hard by are utilised as reservoirs, with sluices and conduits to the gold fields. These reservoirs come best into play in dry seasons, especially in waterless valleys. In well-watered valleys no sluices are required, but only a dam, thereby lessening the expense of construction and the danger of a breach. The high-lying conduits do duty to wash down deposits of ore and to drive water wheels. The tools in use among the Chinese are very simple. Rattan baskets borne on carrying poles serve for bearing away earth. Wooden dishes of different sizes do for washing ore. Hoes are turned to account in loosening the soil. Heavy flat iron rods with steel ends come in handy for breaking up

stony ground. A five-tooth fork is utilised to clear water channels of large stones. To clear mines of water, Chinese chain pumps have been found useful, set in motion by water wheels. A pit 50 square metres and 7.8 metres deep (one metre is equal to 3.28 feet) can be kept dry by three of these pumps. The latter can, however, with difficulty keep down large masses of rising water. The wheel describes 18 to 20 revolutions each a minute, and costs, along with a corresponding pumping gear, about 280 guilders. The wheel wears out in three years, and the pump in four. These preliminaries take up a good deal of time, money, and trouble. The ground over the mine is cleared of jungle, and a canal is dug along the valley to bring water to bear upon the deposit, the overlying soil being first loosened. The water, skilfully directed and aided by manual labour, washes away the surface by the force of the current, and lays the deposit open. When the overlying earth proves too stiff for the water to carry away, coolies remove it in baskets. The ore, when reached, is carried out of the mine in the same way. Should enough of water for washing purposes be not at hand, the ore is stacked until washing operations can be easily taken in hand. The mine is worked in sections, the sides being shored up as operations go on, until the stock of ore becomes exhausted, which generally happens within five or six months. The stacked ore then gets washed in the canal in dishes. Care is taken to intercept every escaping particle of gold by means of other wooden dishes in the hands of women and children. The coarser the gold, the easier the washers separate it in the dishes. True gold sand offers difficulties, especially when mixed with magnetic iron particles. The separation of this fine gold lasts long, and takes much practice. The gold is slightly heated in small copper dishes over a charcoal fire to dry it. Strong heating gives the metal a reddish hue. A magnet then draws off the iron particles, and the gold so purified is put up in small packets weighing two taels. Sometimes the purified gold is melted with saltpetre and poured into hollowed stones to cool into bars. Gold so treated loses 7°/₀ in weight. Gold in sylvanite is secured by heating the ore with or without saltpetre. Gold, however, is mostly sold unmolten, and the price depends upon its pureness. The mountain gold is mined for in a simpler fashion, by means of shafts from 3 to 4 metres deep, to which water is laid by a canal so constructed that its bed lies below the level of the deposit. The auriferous soil, loosened and broken up, is thrown down into the canal. The clay and gravel are washed away by the current, and the larger pieces or stone are pitched aside, while the gold sinks to the bottom. The direction of the canal is changed so as to admit of the whole ground being worked. The gold washing begins after the ore has been sorted. These mountain deposits are worked with less trouble and at less expense than the valley ones, but the mine is sooner exhausted. Valley mining may last for years. Mountain mining lies, too, under the disadvantage of scarcity of water in the dry season, an inconvenience less felt in the valleys. But the mountain mines suit best small capitalists. As may be expected, the profits differ widely. For instance, in 1881, at Shuichit 255 labourers raised 80,000 guilders' worth of gold. In one mine alone, at Benkayang, 21,000 guilders' worth of gold were raised in one year, which, deducting expenses, left a clear profit of 10,632 guilders. Sometimes at a single washing a dish yields 17½ guilders' worth. In 1880 the Sim Pi Tu mine yielded a profit of 4,262 guilders. At Rangga, in 1884-5, each miner earned an average of 1.85 guilders a day. The best of the mines at Rangga, Rinahat Lou Po, and Sungei Idjau, yield per miner a daily average of 3.70, 3.58, 2.47, and 1.74 guilders. The Chinese methods of mining lie open to great improvements. Dynamite would loosen the soil far better than iron tools and shovels. Small carts and more effective means of transport would do away with the need for much manual labour. Much waste of the precious metal in washing operations would be prevented by the use of quicksilver. The great drawback is want of water in dry seasons, which sometimes delays mining for weeks and months. The reservoirs which partially meet requirements, sometimes cannot stand heavy rains, owing to the water swelling and breaching the dams. During the rains mining comes to a standstill, causing great loss of time. A deserted Chinese mining district finally presents a scene of desolation. The ground is covered with sand and heaps of earth, the pits and shafts become filled with water, and resemble small mashes. Vegetation undergoes a check, and takes years to revive and overspread the land once more."

(Fourth Article.)

"The Chinese also turn gold-bearing lodes to practical account by following them up through deep sinkings when opportunity offers. Their insufficient knowledge prevents them from tracing out a lode to great distances, and the shafts and sinkings very often fail them through inadequate shoring. They find it hard, too, to keep down with their primitive pumps, which can only work effectively within from 8 to 10 metres, the water in the mines. Boring and blasting being unfamiliar to them, they have to break up the stone with iron tools, and smash it with hammers. The fragments are stamped fine in granite or sandstone mortars preparatory to bringing the washing dishes into play. Two-thirds of the ore gets lost through these rough methods. However rich may be the outlying lode, it takes the Chinese years to work it in this fashion. Remains in many places show that the Chinese have abandoned many lodes after working at them for a while. They were given up owing to inadequate shoring, increasing depth of the lode, hardness of the stone, and the steady inrush of water. The depth reached varied from 2.5 to 15 metres. The greatest depth attained was at Madjan, where 18 metres were reached.

"About 1880 Europeans started a company to dig for gold in South Borneo, which carried on operations for some time. At Sarawak, near Orte Pau, the Borneo Company has been working gold lodes. Europeans, too, by last advices, have been seeking for the precious metal in North Borneo, at Sabah, and on the Segalind river.

"For ages the natives have practised the art of gold smelting in the peculiar way which the author had an opportunity of beholding in Central Borneo, at Teweh, in 0° 5′ S. The peculiarity lies in the use of a box bellows. The box is about 40 centimetres long, 20 broad, and 15 high, made of wood, with a movable lid, and is fitted with appliances to bring it to bear upon the ore. The latter is smelted by means of a charcoal fire, and the operation must be gone through twice before the gold gets ductile enough. The natives, it should be noted, have a kind of polishing stone by which to determine the quality of the gold through the whitish or yellowish colour of the latter, where the stone has been applied. By smelting together different kinds of gold, they obtain the metal in that mixed form which experience has shown them to be most in demand.

"The Chinese diggers lease the mines from Government. They have no further business dealings with the Government, and may sell the gold they get to anybody. A number of miners combine together into a company or kongsie to work a mine after trial sinkings had showed the richness of the ground The first step is to secure a concession of the latter from the European officials. The obtaining of good auriferous land is now not so easy as before, owing to the best land having already been taken up. Another difficulty arises from the law restricting the granting of mining land near the villages of the natives. After going through the necessary formalities, the lessees give out licenses to the diggers at the rate of one guilder per month each, who thereupon set about the preliminary operations. The number of kongsies is tolerably large. Their aggregate of members, varies much with the extent of the diggings. Besides shareholders, who participate in both gains and losses the mines also give employment to day labourers. They work on fixed wages in numbers increasing of late years, and must find substitutes when absent from duty. When the shareholders have sufficient capital at command, they furnish so much at the outset as to admit of beginning with the costly preliminary operations in laying out water-works, buying tools, and building huts. In gold washing, the profit is divided according to the capital invested. In case of the shareholders borrowing money from rich Chinese at high interest (24 to 36%), they agree to pay both interest and capital out of the gold-washing proceeds as first charge. The creditors naturally take precious good care to enforce their claim on the mine with satisfactory results to themselves in a good year. On a balance remaining, the shareholders do not reserve it for next year's working, but rather borrow money afresh. With small returns, the mine gets deeper and deeper into debt. The usurers make fresh advances readily, but always on hard conditions, stipulating even for share certificates for themselves. Should the mine prove unremunerative, the shareholders become insolvent, and clear out. The usurer then seizes upon the mining plant, and usually tries to start a new kongsie. To him, the failure of the previous undertaking has proved usually no loss, the interest paid generally exceeding the capital advanced. The diggers choose yearly their own headman to superintend and oversee the mining operations, with the aid of a bill collector and a store-keeper. Usually not more than three-fourths

of the labourers work in the mine. The balance busy themselves as carpenters, blacksmiths, cooks, gardeners, and swine-herds. The work lasts the whole day, with five intervals for messing purposes. Lazy labourers have their wages cut, sick ones must submit to a fixed deduction. Tobacco, clothing, and other daily necessaries are brought by the kongsie from neighbouring traders, generally at high rates. When the trader is also usurer, the kongsie is often forced to get supplies from him, and he compels the kongsie to buy necessaries from him at exorbitant rates. The mining premises present the same appearance, consisting as they do of four rectangular connected buildings round a roomy court. In the foremost one, furnished with benches and table gear, the labourers take their common daily meals and spend their free hours in the evenings. The rearmost building is the kongsie house, divided into three parts, one of which contains an image of the Tehpekkong, or Good Spirit, and is kept as reception room. The dwelling place of the bill collector and storekeeper stands on one side of this apartment, and the storehouse on the other. The remaining buildings do duty partly as kitchens and partly as sleeping rooms for bachelor labourers. The married ones live in houses of their own hard by. In the court, not far from the main buildings, stands a small miniature house dedicated to the Evil Spirit. He has more offerings than the good one, owing to the crafty Chinese fancying that the latter can never do them any harm whereas by gaining the favour of the Evil One they prevent him from marring the success of the mine. Each mine has a well-stocked kitchen garden, an arrack manufactory, and a piggery which is kept in thorough cleanliness. At one mine, the Sim Pi Tu, in 1880, the outlay came to 11,780 guilders, divided as follows:—

	Guilders.
Upkeep and Materials	1,000
Rent	552
400 piculs Rice	2,500
Wages	7,728
The gold raised came to 207 taels valued at	16,042·50
Deduct outlay	11,780
Profit	4,262·50

Or 90 Guilders per share.

"These results do not look very encouraging for the development of Chinese rock gold mining. Larger areas cannot be worked, from want of capital, which want also furthers wasteful mining. One bad year is enough at times to ruin a mine financially. Another mine, taken as example, gives the following results for one year's working:—

Outlay.	Guilders.
Two clerks	384
Two Overseers	768
125 day labourers at 16 guilders a month	22,800
Rations for 129 men at 9 guilders a head	13,932
Dwellings and Tools	5,000
	42,884

against a taking of 800 taels of gold valued at 57,000 guilders."

(Concluded).

"Unfortunately accurate statistics of the gold yield in Borneo are not available, but, so far as our information goes, it reached the highest point at the end of the last century and the outset of the present one. In the 'fifties,' it began to lessen considerably,

and has continued to fall off ever since. Of the States on the East Coast, nominally under Netherlands rule, we know next to nothing under this head, and must rely upon vague and inaccurate native report, generally untrustworthy and exaggerated. Better information, but not much, lies within reach as to the outturn of the precious metal in West and South Borneo. In this part, especially in the West, most gold seems to be produced from causes not far to seek.

"In South and West Borneo, the gold seekers, from being under direct Dutch rule, enjoy protection, but in East Borneo diggers have to put up with the arbitrary government of the native chiefs. The natives there, who happen to be gold diggers on however small a scale, have not only to pay the usual taxes, but also many squeezes, which draw away a large portion of their earnings, and naturally act as sore discouragement on industry. This injustice falls particularly heavy upon the Chinese resorting to those countries in quest of gold which they hear abounds there. On finding themselves wholly at the mercy of the arbitrary rulers of the land, never, at the best, friendly to them, and liable to be squeezed at any time, they soon leave the country. Gold mining hence remains wholly in the hands of those few natives who have the enterprise to work on despite of oppression. In Solo and in the peninsula of Unsang in the North of island, Chinese began in the 'forties' to open up diggings, but illtreatment and massacres soon drove them away.

"Far otherwise is it in South and West Borneo. There, gold diggers, under the protection of the

Netherlands India Government, may do what they like with their gains after paying a fixed tax yearly. Consequently, the Chinese flock thither, especially to West Borneo, where, as already mentioned, they at one time formed powerful mining kongsies to carry on their business more energetically and successfully. Dr. Posewitz found the Chinese miners very reticent about how they had fared, and disinclined to give information of their profits. When questioned, they always talk of bad business or losses, from fear of heavier taxation, or to frighten off other kongsies from settling near them. Another difficulty arises from the common Chinese practice of burning all their books at the close of a business year, leaving next to nothing to refresh the memory of past transactions. Moreover, the complicated nature of the latter do not readily admit of a succinct balance sheet, and the written characters raise another difficulty in inspecting the available books. The fact that much of the gold produced meets with sale in the country and does not figure in the export returns baulks close inquiry. These hindrances have made all estimate of the gold yield pure guesswork, the only thing certain being that the production of the yellow metal has been steadily falling off. Similar causes defeat finding out how the production stands among the natives. Some idea of the outturn may be gathered from the conclusions of investigators in favourable localities. In 1836, Horner found at Gunong Lawak, in South Borneo, 200 gold and diamond shafts with 3,000 to 4,000 washers, the Chinese miners earning 400 guilders yearly and a native about 100. The monthly yield of these diggings came then to 49,000

guilders. In 1834, so Horner says, 70,000 guilders' worth of gold was exported from Banjermassin. In all the South Bornean river basins, the natives washed much gold in former years. They also worked profitably in the valleys of the Barito, Kapuas, and Kahayan rivers. In the latter, a Dyak could readily make 2 to 3 guilders a day with primitive appliances. Dr. Posewitz gives facts and figures showing the lessened yield of gold, owing mainly to the mines giving out. At present the gold mining industry makes most head in Sambas, Mandor, and Mampawa. At Landak and Sinkawang, the washings yield much gold. Several districts mined in former years have been forsaken by diggers, but they still zealously seek for the precious metal along the Kapuas, Sikayam, and Melawie Rivers. In Sarawak, the gold exported amounted to 21,754 German pounds in 1885, and 28,281 in 1886. Gold has never been found in Brunei. In Sabah, that metal has been found too short a time ago to admit of accurate data being available.

" Statistics of gold production earlier in the century show large aggregates. Raffles valued the yield in 1812 at about $4\frac{3}{4}$ million of dollars, but Crawford puts it down at only 1,668,000 dollars. In 1823, Tobias estimated the export at about 2,000,000. dollars. The figures for 1848 stand at 1,349,000 dollars. In the 'forties,' the export from the Kapuas, Kahayan, and Katingan Rivers reached an average yearly value of 480,000 guilders. The amount could certainly have been larger had it not been for the natives only collecting as much as would satisfy their few wants. It is only in the 'eighties' that more reliable data became available.

The author then marshals tabular statements of the gold yield in the so-called Chinese districts in West Borneo, so far as it can be estimated from the returns furnished by the revenue farmer. The quantity of the precious metal secured by washers and fossickers cannot be estimated, owing to their exemption from revenue farming. The figures he musters bear upon Sambas and Montrado, showing a steady fall in the production of gold from 208,296 guilders' worth in 1884 to 155,200 guilders in 1886. The export takes place chiefly to Singapore, and comes to 48,600 guilders in 1885 against 121,000 in 1882. Between 1871 and 1879, the yearly export from Sinkawang and Pamangkat averaged 211,000 guilders. The price of gold in the producing districts stood at about 40 guilders per tael 30 years ago. At present the value stands higher, but varies much in the different districts, according to the fineness and purity of the metal, the presence of magnetic iron, silver and copper lowering the price. Gold from Mandor stands low, owing to its admixture with silver and copper. The gold from *Benkayang*, *Budok*, *Katangan*, the Skadau mountains, and the Pandan hills show signs of silver. The purest and best gold comes from Sepang, and bears a reddish hue. In West Borneo the price stands at present from 75 to 81 guilders per tael, 70 being the value with an admixture of silver in the ore. At Kusan, in East Borneo, a tael of gold brings no more than 62.50 guilders.

"The fact that Borneo abounds in gold comes home to foreigners visiting the island on seeing how the natives avail themselves of the metal in decorating their persons. The goldsmiths of the country turn

ornaments out in tasteful fashion, their skill being amply utilised by the richer classes, especially by chiefs and their families. The ex-Sultan of Martapura, for instance, possesses a golden cannon. The Rajah of Gunong Tabor has one weighing 50 catties. In the interior, gold has been found useful for bartering purposes, it being duly measured and weighed. At Melabui, in West Borneo, gold is weighed in accordance with the following subdivisions:—

1 Bungkal = $1 = 1 Tael.
1 Bungkal = 16 Amas.
1 Amas = 2 Jampul.
1 Jampul = 2 Suku.
1 Suku = 2 Stali.
1 Stali = 3 Wang.

"In the northern part of the island towards Sarawak, gold mining has ever been carried on to a considerable extent, but the author does not stop to deal with the subject at length. He confines himself under this head to Netherlands Borneo. Digging for gold there has mostly fallen off in the Chinese districts and in Tanah Laut, formerly noted for abundance of yield The author, deeming native and European mining of little practical account, takes note only of Chinese enterprise in that direction. In the interior, several gold-bearing river basins are so unexplored that nothing is known how it stands there with production. The difficulty in detecting any falling off in East Borneo arises from secrecy among the diggers to protect themselves from squeezes. The chiefs take care to make gold mining a Government monopoly. From other neighbouring Native States no information can be obtained. In the provinces under Dutch rule, especially in Tanah Laut and the Chinese districts, the safety of life and property admits of the free development of gold mining. The first check to the yield of that metal in West Borneo arose from long years of war between the Netherlands India Government and the Chinese diggers until their subjugation in 1854. Most of their capital was used up in consequence, many miners fell in battle or fled the country, and it was long before the Chinese there again betook themselves to mining pursuits. In Tanah Laut, a war which raged from 1859 to 1864, and resulted in the overthrow of the Sultanate, had the same consequence in lessening the yield of the gold and diamond fields, owing to the miners forsaking them. The main cause, it is alleged by some, arises from exhaustion of the richest and most accessible mining ground. The surface finds may have been worked out, but there is every sign of rich deposits and lodes underground at deeper places. Want of capital and scarcity of labour stand in the way. Land known to be richly gold-bearing, but difficult of access, remains neglected. Geological investigation shows the likelihood of valuable deposits rewarding research. Thorough prospecting and greater command of capital offer every chance of remunerative mining. In West Borneo, within the basins of the Sambas and Sebangkan rivers, deep-lying gold deposits still lie untouched. The same may be said of the Skadau mountains.

" Dr. Posewitz deems another cause of the falling off to spring from the price of gold in Europe being lower than in Borneo. He would take a hopeful view of gold mining there were the Government to

help European capitalist enterprise in that direction in every way, especially by trial borings and mineralogical research under official direction. Improvements in the present Chinese methods, such as bringing machinery to bear on the ore before it reaches the canals, using dynamite to remove overlying earth, following less wasteful ways of washing gold, and exercising larger command of capital, would soon, he thinks, despoil the deep valley deposits. European labour alone proves dearer than Chinese, and would increase the cost of production. Financial and industrial aid to Chinese labour seems to him the most advisable."

The foregoing information has been taken from the following authorities.

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